

# **Takings Permit Application**

### NorthMet Project

Prepared for Poly Met Mining, Inc. November 2017

4300 MarketPointe Drive, Suite 200 Minneapolis, MN 55435 952.832.2600 www.barr.com

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## 1.0 Nature of Project

Poly Met Mining, Inc. (PolyMet) proposes to construct the NorthMet Project (Project). The Project, located near Hoyt Lakes Minnesota, will include a Mine Site, a Plant Site, and connecting corridors (Large Figure 1).

The Project area has been disturbed by previous mining and logging activities and 13 populations of one state-endangered plant species was documented within the vicinity of the Project areas. However, impacts are unavoidable in one location that currently supports a state-endangered species population. For this reason, PolyMet is submitting this application for a takings permit.

This takings permit application is organized into the following sections:

- summary of botanical survey work conducted in the vicinity of the Project areas
- discussion of the life history, distribution, and habitat of the plant species to be taken
- avoidance and minimization
- review of the locations of species to be taken
- proposed mitigation measures

## 2.0 Summary of Botanical Surveys

PolyMet conducted several botanical studies in the vicinity of the Project to identify whether any vascular plant species listed by the state of Minnesota as endangered or threatened were present.

- Foth & Van Dyke and Associates, Inc. conducted a rare plant survey in Sections 2, 3, and 10 of Township 59N and Range 13W in 1999, prior to on-site mineral exploration by PolyMet (Reference (1)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey is available in Reference (1).
- Professional botanist Cindy Johnson-Groh conducted surveys in Sections 2, 3, 10, 11, and 16 of Township 59N and Range 13W in July 2004 to assess the presence of *Botrychium* species in the vicinity of the Project (Reference (2)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey, including the survey location and presence of state-special concern plant species, is available in Reference (2).
- Deborah Pomroy completed a rare plant survey on the Mine Site in spring 2004, focusing on Sections 3, 4, 9, and 10 of Township 59N and Range 13W (Reference (3)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey is available in Reference (3).
- Gary Walton completed a rare plant survey on the Mine Site in spring 2004, focusing on Sections 1, 2, 11, and 12 of Township 59N and Range 13W (Reference (4)). This survey documented one state-endangered plant species, *Caltha natans* (floating marsh marigold). *Caltha natans* was documented in five locations in the Mine Site (Sections 1, 10, and 12 of Township 59N, Range 13W) and in eight locations adjacent to the Mine Site (Sections 1, 11, and 12 of Township 59N, Range 13W) (Table 1). One *Caltha natans* population (#2 in Table 1) is located in the south end of the Category 2/3 Waste Rock Stockpile; as such, adverse impacts to this *Caltha natans* population is likely. Additional information on this vascular plant survey, including the presence of state-special concern plant species, is available in Reference (4).
- Daniel Jones of Barr Engineering Co. completed a field survey for *Botrychium* species along the internal road network at the Mine Site and along Dunka Road for the length of the Mine Site (Reference (5)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey, including the presence of state-special concern plant species, is available in Reference (5).
- Daniel Jones of Barr conducted a sensitive plant survey in June and July 2008 along Dunka Road and the proposed pipeline alignment from the west end of the Mine Site to the Plant Site (Reference (6)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey, including the presence of statespecial concern plant species, is available in Reference (6)).

- Midwest Natural Resources Inc. (MNRI) completed rare plant surveys in 2008 in Sections 3, 4, 5, and 9 of Township 59N and Range 13W (Reference (7)). No state endangered or threatened vascular plant species were identified during this survey. Additional information on this vascular plant survey, including the presence of state-special concern plant species, is available in Reference (7).
- Daniel Jones of Barr completed a field survey for *Botrychium* species around the Plant Site in 2017 (Reference (8)). The initial field survey results identified one state-endangered plant species, *Botrychium ascendens* (upswept moonwort), and one state-threatened plant species, *Botrychium lunaria* (common moonwort). Both *Botrychium* species were documented at the Plant Site (Section 33 of Township 60N, Range 14W). However, the Minnesota Department of Natural Resources (DNR) State Botanist determined that the *B. ascendens* was *B. pallidum* (special concern), and that the *B. lunaria* identification could not be conclusively verified. The field survey also identified *Botrychium ascendens* in the processing area (Section 9 of Township 59N, Range 14W). However, the DNR State Botanist determined that the identification could not be conclusively verified. As a result of the field survey and the DNR verifications, there is no verified presence of endangered or threatened plant species at the Plant Site. Additional information on this vascular plant survey is available in (Reference (8)).

Location #	Botanical Name	Common Name	DNR status	Population Size
1	Caltha natans	Floating marsh marigold	Endangered	5 small patches
2 <sup>(1)</sup>	Caltha natans	Floating marsh marigold	Endangered	Several patches from 1 to 3 ft <sup>2</sup> each
3	Caltha natans	Floating marsh marigold	Endangered	4 small plants
4	Caltha natans	Floating marsh marigold	Endangered	5 patches about 6 $ft^2$ each and one at about 75 $ft^2$
5	Caltha natans	Floating marsh marigold	Endangered	2 small plants
6	Caltha natans	Floating marsh marigold	Endangered	3 small plants
7	Caltha natans	Floating marsh marigold	Endangered	Scattered over a 20 ft <sup>2</sup> area
8	Caltha natans	Floating marsh marigold	Endangered	About ½ ft <sup>2</sup>
9	Caltha natans	Floating marsh marigold	Endangered	11 small plants
10	Caltha natans	Floating marsh marigold	Endangered	30 ft <sup>2</sup>
11	Caltha natans	Floating marsh marigold	Endangered	19 small plants (about ½ ft <sup>2</sup> each)
12	Caltha natans	Floating marsh marigold	Endangered	36 seedlings and one slightly larger plant
13	Caltha natans	Floating marsh marigold	Endangered	31 seedlings

#### Table 1 Summary of Documented Caltha natans in 2004 PolyMet Mine Site Survey

(1) This population will be adversely impacted by the Project

# 3.0 Life History, Distribution and Habitat of Caltha natans in Minnesota

*Caltha natans* is a distinctive plant that bears only superficial resemblance to the more familiar *C. palustris* (common marsh marigold), which is larger and has yellow flowers (Reference (8)). *Caltha natans* has small, white flowers about 1 centimeter (0.4 inches) in diameter. Leaves are simple, thin, and subentire. The leaves and petioles commonly float in shallow water, but when water recedes the entire plant may be stranded in mud. Unlike the other species of *Caltha* in North America, *C. natans* is relatively invariable morphologically and has not been divided into segregated taxa. It is a perennial herb and is insect-pollinated.

*Caltha natans* occurs in shallow (often 6-7.6 decimeters (2-2.5 feet)), slow-moving water in streams, creeks, pools, ditches, sheltered lake margins, swamps, and beaver ponds. It typically roots in mud, silt, or clay, and it spreads when stems root at the nodes. Some sites may support only a few scattered individuals but other sites may have a dense mat consisting of many plants. In Minnesota, *C. natans* is associated with *Glyceria* spp. (manna grass), *Carex* spp. (sedges), *Potamogeton* spp. (pondweed), and *Utricularia* spp. (bladderwort), with an overstory of *Fraxinus nigra* (black ash) or *Salix* spp. (willow).

The statewide and regional presence of *Caltha natans* was evaluated using the DNR Natural Heritage Information System (NHIS) database. The NHIS database indicates that there are 40 records of *Caltha natans*, all of which are located in St. Louis County.



The NHIS records include site descriptions and plant associations for each population recorded. This information was used to sort the records into general habitat types, and to then analyze the relative occurrence of each species within those habitat types. Two habitat types were identified from the NHIS records for *Caltha natans*, which include:

<u>Mudflats, shallow channels, small pools, and areas of beaver altered hydrology</u> – The most commonly associated habitat types in the NHIS for *Caltha natans* are mudflats, shallow pools, and channels, frequently associated with beaver activity and growing along the edges of these water features.

**<u>Drainage ditch</u>** – a few records describe the habitat as part of a roadside drainage ditch with high water conditions.

The NHIS records for each species were grouped by habitat type, and the percent of occurrences in each habitat type was calculated. The percent distribution of records for *Caltha natans* in each of these habitat types is shown in Table 2.

#### Table 2 Percent Occurrence of Caltha natans by General Habitat Type

	Percent Occurrence <sup>(1)</sup> by General Habitat Type			
Species	Mud Flats, Shallow Channels, Small Pools, and Areas of Beaver Altered Hydrology	Drainage ditches		
C. natans	92%	8%		

(1) Based on DNR NHIS records

## 4.0 Avoidance/Minimization

PolyMet and Barr have consulted the data obtained in the botanical surveys in the vicinity of the Project areas to evaluate the possibility of altering the Project design to avoid or minimize impacts to listed species. Due to the scale of the Project, and the distribution of listed species located within the Project limits, there are no feasible design modifications that would avoid the one population of listed plant species or minimize impacts in the one location (Large Figure 2)

# 5.0 Location and Species to be Taken

The location of the *Caltha natans* to be taken is shown on Large Figure 2.

No other state-listed plant species will be taken by the Project. A description of the mitigation plan to compensate for this unavoidable loss is presented in the following section.

## 6.0 Proposed Mitigation Measures

Where there is no feasible alternative to taking a listed species, DNR has accepted compensatory mitigation to reduce the impact of the loss of the population. Compensatory mitigation strategies have included:

- funding of the state acquisition of another site where the species occurs
- funding additional survey work to locate other sites
- funding research to develop better understanding of the species

In the case of Caltha natans, any of the three above options would be feasible.

PolyMet considered the purchase of an unprotected *Caltha natans* site elsewhere. However, the challenge to acquiring such a site is the limited distribution of *Caltha natans* in the state. There are 40 documented records of the species statewide, all in St. Louis County. Most of the documented records are clustered, such that there are only 16 general locations of the species in the state. One of these is at the Mine Site. The limited availability of suitable sites makes a purchase option by PolyMet unfeasible.

# 7.0 Summary

One population of *Caltha natans* occurs in a part of the Project area that will be disturbed. Removal of this population is unavoidable, due to the scale and design of the proposed Project.

Large Figures



<sup>1</sup> The final extent of the Mining Area boundary will be determined by applicable legal descriptions and surveys. <sup>2</sup> These are provisional representations of Public Waters Inventory watercourses downloaded from the Minnesota Geospatial Commons website (https://gisdata.mn.gov/) on November 3, 2017. Due to previous disturbance in this area, data sources may show watercourses that no longer exist. <sup>3</sup> The National Hydrography Dataset (NHD) is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD features are created from DNR 24K Streams and 1:24,000 USGS quadrangle maps. Due to previous disturbance in this area, data sources may show watercourses that no longer exist.



Large Figure 1 DNR Take Permit



Due to previous disturbance in this area, data sources may show watercourses that no longer exist.

DNR Take Permit